

REMARKS

Applicants have carefully reviewed and considered the Office Action mailed on October 3, 2003, and the references cited therewith.

Applicants respectfully point out that the list of pending claims appearing in Paragraph 4 of Form PTOL-326 of the Office Action is incorrect. Claims 1-10 and 28-50 are pending in this application.

No claims have been amended, canceled, or added by way of this response.

**Supplemental Information Disclosure Statement
Submitted on August 8, 2002**

Applicants submitted a Supplemental Information Disclosure Statement and a 1449 Form on August 8, 2002. Applicants note that the Examiner returned the Form 1449 with the Office Action that was mailed on November 20, 2002, and that all but one listed document was initialed by the Examiner as having been considered. In such 1449 Form the last item (Brendel et al.) in the "Foreign Patent Documents" category was not initialed by the Examiner.

Applicants assume that the reason that this reference was not initialed by the Examiner is that it does not appear to be a valid reference, because its publication date is after the filing date of the present application.

However, if this assumption is not correct, then Applicants respectfully request that the Examiner return a copy of the 1449 Form, bearing the Examiner's initials next to the document listed as Brendel et al., WO-01/00573, to Applicants' Representatives with the next official communication, to indicate that all cited references have been considered by the Examiner.

Katou et al. Reference Not Listed on Form PTO-892

Applicants respectfully note that the Katou et al. reference (JP-163447), which was applied by the Examiner in the rejection of claims 7-9, 37-39, and 42-44, was not listed on the Form PTO-892. In a telephone conversation with Examiner David Martin on November 21, 2003, Applicants' attorney Walter W. Nielsen pointed this out and requested that this reference be officially cited in the record on a Form PTO-892. Although a copy of the reference was

subsequently received by FAX from Examiner Martin, Applicants to date have not received a Form PTO-892 citing the Katou et al. reference.

Applicants are submitting herewith a Supplemental Information Disclosure Statement, citing the Katou et al. reference and providing a more complete translation than that provided in the copy FAX'd by Examiner Martin. Applicants respectfully request that these documents be considered by the Examiner and made of record, and that a copy of the 1449 form, initialed by the Examiner to indicate that all listed citations have been considered, be returned with the next official communication.

Rejection of Claims 1, 10, 40 and 45 under 35 U.S.C. §103(a)
as Unpatentable over Branchevsky in View of Arima

Claims 1, 10, 40 and 45 were rejected under 35 U.S.C. §103(a) as being unpatentable over Branchevsky (U.S. 6,252,761) in view of Arima et al. (U.S. 5,281,151).

Branchevsky discloses a multi-layer ceramic capacitor 100 (FIG. 9, see col. 4, lines 16-18). One set of electrodes (110, 118, and 126) and a second set of electrodes (114 and 122) are separated by dielectric layers (112, 116, 120, and 124). A via 128 contacts the left-hand side (as seen in FIG. 9) of electrodes 110/118/126, and a via 130 contacts the right-hand side of electrodes 114/122. Also, in FIGS. 1-8 of Branchevsky, various prior art structures of ceramic substrates having embedded capacitors are shown. It is noted that Branchevsky does not appear to contain any disclosure concerning an organic substrate.

Arima discloses a first multi-layer wiring conductor in the form of a multi-layer ceramic board 2, and a second multi-layer wiring conductor in the form of a thin-film circuit board 3 having laminated organic layers (see col. 2, line 65 through col. 3, line 22 and FIG. 1). An integrated circuit 9 is mounted on the thin film circuit 3. It is noted that Arima does not appear to contain any disclosure concerning an internal capacitor.

The Examiner stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Arima with the substrate of Branchevsky "for the purpose of providing greater heat resistance" [sic]. Applicants respectfully cannot understand this statement, and Applicants respectfully request that the Examiner elaborate on this statement in the next official communication.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103, the prior art reference (or references when combined) must teach or suggest every limitation of the claim. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA, 1974). MPEP §2143.

The asserted combination of Branchevsky in view of Arima fails to teach or suggest all of the claim limitations present in independent claims 1, 31, and 41, so a *prima facie* case of obviousness has not been established.

Independent claim 1 recites *inter alia* a multilayer substrate comprising a ceramic portion having an embedded capacitor, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky or Arima for combining these references to arrive at the subject matter claimed in claim 1. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Applicants respectfully assert that the suggested combination of Arima and Branchevsky is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Thus, Applicants respectfully assert that a *prima facie* case of obviousness has not been established. First, the Examiner has not provided any teaching, suggestion, or motivation in the references themselves. Secondly, the Examiner has not provided any credible teaching, suggestion, or motivation in the knowledge generally available to one of ordinary skill in the art, to combine the Branchevsky and Arima references to arrive at Applicants' claimed subject matter.

Regarding the issue of when it is reasonable to combine references to establish obviousness, the Examiner is referred to *In Re Sang Su-Lee*, Serial No. 07/631,240, CAFC, 00-1158, January 18, 2002 (a copy was provided in the response dated June 27, 2003).

On page 7, beginning line 19, the CAFC stated:

“ ‘The factual inquiry whether to combine references must be thorough and searching.’ *Id.* It must be based on objective evidence of record.”

On page 9, beginning line 1, the CAFC stated:

“ . . . the examiner can satisfy the burden of showing obviousness of the combination ‘only by showing some objective teaching in the prior art or

that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references' ”.

In the present case, Applicants respectfully assert that the Examiner has not produced any convincing objective evidence to support his position that it would have been obvious to combine the teaching of Branchevsky and Arima.

For the above reasons, independent claim 1 should be found to be allowable over any combination of Branchevsky and Arima, and Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Branchevsky in view of Arima should be withdrawn.

Claim 10, which depends from claim 1 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above.

Independent claim 31 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky or Arima for combining these references to arrive at the subject matter claimed in claim 31. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Applicants respectfully assert that the suggested combination of Arima and Branchevsky is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claim 40, which depends from claim 31 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above.

Independent claim 41 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky or Arima for combining these references to arrive at the subject matter claimed in claim 41. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any

disclosure concerning providing an internal capacitor. Applicants respectfully assert that the suggested combination of Branchevsky and Arima is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claim 45, which depends from claim 41 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above.

Rejection of Claims 2-4, 6, 28-32, 34, 36, 41 and 46
under 35 U.S.C. §103(a) as Unpatentable
over Branchevsky in View of Arima
and Further in View of Saia

Claims 2-4, 6, 28-32, 34, 36, 41 and 46 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Branchevsky, as modified, as applied to claim 1, and further in view of Saia et al. (U.S. 5,736,448). The Examiner's statement of this ground of rejection is ambiguous; however, Applicants interpret it to mean a rejection over Branchevsky in view of Arima and further in view of Saia.

The Examiner stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to "use the land/interconnection design of Saia et al. for the capacitor of Branchevsky, as modified, for the purpose of providing multiple capacitances". Applicants respectfully cannot understand this statement, and Applicants respectfully request that the Examiner elaborate on this statement in the next official communication, indicating the specific structure by referring to the figures of Branchevsky, Arima, and Saia.

Applicants also point out that the lands (36a, 44a, and 52a, FIG. 9) of Saia are for the purpose of interconnecting plates of like polarity within capacitor 54 (FIG. 9) and are not "positioned to couple to corresponding power supply nodes of the die", as recited in claims 1, 28, 31, and 41.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103, the prior art reference (or references when combined) must teach or suggest every limitation of the claim. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA, 1974). MPEP §2143.

The asserted combination of Branchevsky in view of Arima and further in view of Saia fails to teach or suggest all of the claim limitations present in independent claims 1, 28, 31, and 41, so a *prima facie* case of obviousness has not been established.

As stated earlier, independent claim 1 recites *inter alia* a multilayer substrate comprising a ceramic portion having an embedded capacitor, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Saia for combining these references to arrive at the subject matter claimed in claim 1. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Nor does Saia appear to contain any disclosure concerning a capacitor embedded in a ceramic portion of a multilayer substrate.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Saia is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Thus, Applicants respectfully assert that a *prima facie* case of obviousness has not been established. First, the Examiner has not provided any teaching, suggestion, or motivation in the references themselves. Secondly, the Examiner has not provided any credible teaching, suggestion, or motivation in the knowledge generally available to one of ordinary skill in the art, to combine the Branchevsky, Arima, and Saia references to arrive at Applicants' claimed subject matter.

Claims 2-4 and 6, which depend directly or indirectly from claim 1 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Independent claim 28 recites *inter alia* forming a first portion of a substrate using ceramic materials, the first portion having at least one capacitor between the upper and lower surfaces of the first portion. Claim 28 further recites forming a second portion of the substrate using organic materials, the second portion having a plurality of conductors therein.

Applicants assert that the Branchevsky, Arima, and Saia references fail to teach all of the limitations of claim 28. Further, for the reasons given above, there is no suggestion or motivation in Branchevsky, Arima, or Saia for combining these references to arrive at the subject matter claimed in claim 28. Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning

providing an internal capacitor. Nor does Saia appear to contain any disclosure concerning a capacitor embedded in a ceramic portion of a multilayer substrate.

Claims 29 and 30, which depend from claim 28 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Independent claim 31 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Saia for combining these references to arrive at the subject matter claimed in claim 31. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Nor does Saia appear to contain any disclosure concerning a capacitor located in a ceramic portion of a multilayer substrate.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Saia is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claims 32, 34, and 36, which depend directly or indirectly from claim 31 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Independent claim 41 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Saia for combining these references to arrive at the subject matter claimed in claim 41. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Nor does Saia appear to contain any disclosure concerning a capacitor located in a ceramic portion of a multilayer substrate.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Saia is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claim 46, which depends from claim 41 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above.

Rejection of Claims 5, 33, 35 and 47-50
under 35 U.S.C. §103(a) as Unpatentable
over Branchevsky in View of Arima, Saia, and Figueroa

Claims 5, 33, 35 and 47-50 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Branchevsky, as modified, as applied to claim 4, and further in view of Figueroa et al. (U.S. 6,532,143). The Examiner's statement of this ground of rejection is ambiguous; however, Applicants interpret it to mean a rejection over Branchevsky in view of Arima, Saia, and Figueroa.

Applicants point out that Figueroa is not a valid reference under 35 U.S.C. §103(a), because the filing date of Figueroa is later than the filing date of the present application.

Accordingly, Applicants respectfully request that the rejection of claims 5, 33, 35 and 47-50 under 35 U.S.C. §103(a) as being unpatentable over Branchevsky, in view of Arima, Saia, and Figueroa be withdrawn.

Rejection of Claims 7-9, 37-39 and 42-44
under 35 U.S.C. §103(a) as Unpatentable
over Branchevsky in View of Arima
and Further in View of Katou

Claims 7-9, 37-39 and 42-44 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Branchevsky, as modified, as applied to claim 1, and further in view of Katou et al. (JP 10-163447). The Examiner's statement of this ground of rejection is ambiguous; however, Applicants interpret it to mean a rejection over Branchevsky in view of Arima and Katou.

Branchevsky and Arima were discussed previously.

Katou discloses a thin-film capacitor (e.g. FIG. 2) comprising a dielectric layer 2. The Examiner describes the capacitor of Katou as a "multi-layer capacitor [figure 2] having varying permittivity film layers". Applicants point out that FIG. 2 of Katou does not appear to disclose a

capacitor having more than one dielectric layer 2. Further, Applicants were unable to find any mention in Katou of “varying permittivity film layers” and respectfully request the Examiner to point out the specific page and line number describing same in the machine translation supplied to the Examiner in the Supplemental Information Disclosure Statement accompanying this response.

The Examiner stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to “vary the permittivity of the various layers of Branchevsky, as modified, as suggested by Katou et al., for the purpose of controlling the electrical characteristics of the capacitor”. Applicants respectfully cannot understand this statement, because none of Applicants’ claims 7-9, 37-39 and 42-44 refer to “varying the permittivity” or “controlling the electrical characteristics of the capacitor”, and Applicants respectfully request that the Examiner elaborate on this statement in the next official communication.

The asserted combination of Branchevsky in view of Arima and further in view of Katou fails to teach or suggest all of the claim limitations present in independent claims 1, 31, and 41, so a *prima facie* case of obviousness has not been established.

As stated earlier, independent claim 1 recites *inter alia* a multilayer substrate comprising a ceramic portion having an embedded capacitor, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Katou for combining these references to arrive at the subject matter claimed in claim 1. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Katou appears merely to disclose a thin-film capacitor.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Katou is based solely upon hindsight and would not have been suggested but for Applicants’ own disclosure.

Claims 7-9, which depend directly or indirectly from claim 1 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Independent claim 31 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion,

and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Katou for combining these references to arrive at the subject matter claimed in claim 31. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Katou appears merely to disclose a thin-film capacitor.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Katou is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claims 37-39, which depend directly or indirectly from claim 31 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Independent claim 41 recites *inter alia* a multilayer substrate comprising a ceramic portion having a capacitor located between the upper and lower surfaces of the ceramic portion, and an organic portion comprising a plurality of conductors. There is no suggestion or motivation in Branchevsky, Arima, or Katou for combining these references to arrive at the subject matter claimed in claim 41. As pointed out earlier, Branchevsky does not appear to contain any disclosure concerning an organic substrate, nor any suggestion of combining an organic substrate with the ceramic substrate shown in Branchevsky. Nor does Arima appear to contain any disclosure concerning providing an internal capacitor. Katou appears merely to disclose a thin-film capacitor.

Applicants respectfully assert that the suggested combination of Branchevsky, Arima, and Katou is based solely upon hindsight and would not have been suggested but for Applicants' own disclosure.

Claims 42-44, which depend directly or indirectly from claim 41 and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Additional Elements and Limitations

Applicants consider additional elements and limitations of claims 1-10 and 28-50 to further distinguish over the cited references, and Applicants reserve the right to present arguments to this effect at a later date.

Conclusion

Applicants respectfully submit that claims 1-10 and 28-50 are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney, Walter W. Nielsen (located in Phoenix, Arizona) at (602) 298-8920, or the below-signed attorney (located in Minneapolis, Minnesota) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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By their Representatives,

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Date Jan. 5, 2004

By Ann M. McCrackin
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 5 day of January, 2004.

KACIA LEE

Name

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Signature